PRACTICE MAKES PERFECT

Solve all of these problems mathematically.

1. What are the components of a position vector 100 km [E30°N]? **86.6 km [E]; 50 km [N]**

2. What are the components of a position vector 20 km [N30°W]? **17.3 km [N]; 10 km [W]**

3. Jedi Knight walks 30 m [N], 20 m [N30°E] then 20 m [S].
   Determine his resultant displacement. **29.1 m [N20°E]**

4. Bin Lookin walks 20 km [N45°E] followed by 10 km [E30°S].
   Determine her resultant displacement. **24.6 km [N68°E]**

5. A busy bee buzzes 200 m [N] followed by 200 m [E30°N].
   Determine its total displacement. **346 m [N30°E]**

6. Miss M^{C}Arthur jogs 100 m [N10°E] followed by 200 m [W40°S].
   What was her resultant displacement? **139 m [W12.5°S]**

7. An airplane flies 5 km [E] and then flies 7.0 km [N].
   a. Determine the distance travelled.
   b. Determine the plane's resultant displacement. **8.6 km [E54°N]**

8. A sailboat travels 20 km [E25°N] and then moves 45 km [N40°W].
   What is the sailboat's total displacement? **44.3 km [W76°N]**

9. A police officer chasing a speeding motorist travelled 60 km [S], 35 km [N45°E] and finally 50 km [W].
   What is the officer's total displacement?
   43.2 km [S36°W]

10. A hiker walks 10.0 km [N45°E], 5.0 km [W] and then 2.0 km [S].
    a. What is the distance travelled by the hiker?
    b. What is the hiker's displacement? **5.5 km [E68°N]**

11. Find the distance travelled and resultant displacement, using the component method, for the addition of the following three vectors: 8.0 km [E70°N], 6.0 km [W23°N] and 10 km [S50°E]. *Submit this question for assessment in two days. Those that did not bother to read this far or do the homework will feel slightly displaced… Sneaky.*